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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,695	04/13/2001	Stephen R. Forrest	10020/22301	4983
23838	7590	03/17/2004	EXAMINER	
KENYON & KENYON 1500 K STREET, N.W., SUITE 700 WASHINGTON, DC 20005			PHAN, THIEM D	
			ART UNIT	PAPER NUMBER
			3729	11
DATE MAILED: 03/17/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/833,695

Applicant(s)

FORREST ET AL.

Examiner

Tim Phan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2003.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final:  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-86 is/are pending in the application.  
4a) Of the above claim(s) 2-8, 22, 23, 33 & 40-86 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1, 9-21, 24-32 & 34-39 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3 & 6.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_

**DETAILED ACTION*****Election/Restrictions***

1. Applicants' election with traverse of Group B1 (Claims 13-15 and 19-21) in Paper No. 10 is acknowledged. The traversal is on the ground(s) that the Sub-species B1 and B2 do not have mutually exclusive characteristics as required (Cf. MPEP 806.04(f). This is not found persuasive because the Examiner has established a prima facie case having shown in Paper No. 9, that the invention of Sub-species B1 (Claims 13-15 and 19-21) which are dependent of Claim 1 and have a disclosure “ depositing a thin metal film over a substrate” (Cf. Claim 1, line 2) which are not found in Sub-species B2, while the second Sub-species B2 cites a separate utility such as patterning a substrate (Cf. Claim 40, line 1).

In accordance with MPEP § 803, the Examiner has demonstrated that the inventions of Groups B1 and B2 are each independent or distinct as claimed (indicated in Paper No. 7) and a serious burden would be placed on the Examiner. The requirement is still deemed proper and is therefore **made FINAL**.

Claims 2-8, 22, 23, 33 and 40-86 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Groups, there being no allowable generic or linking claim.

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Applicants are required to cancel these nonelected Claims (2-8, 22, 23, 33 and 40-86) or take other appropriate action.

An Office Action on the merits of Claims 1, 9-21, 24-32 and 34-39 now follows.

### *Abstract*

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Currently, the Abstract has 202 word counted. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 9-21, 24-32 and 34-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (US 6,294,398 B1) hereinafter '398 in view of Whitesides et al (US 5,900,160) hereinafter '160 or vice versa.

**As applied to claim 1**, the '398 teaches a method for patterning devices which reads on applicants' claimed limitations, including:

- depositing a thin metal film (Cf. Fig. 1, element 208) above base layers having a substrate layer (Cf. Fig. 1, element 202);
- pressing a patterned die (Cf. Fig. 1, element 102) having at least one raised portion (Cf. Fig. 1, element 106) and having a metal layer or adhesive (Cf. Fig. 1, element 108; col. 2, lines 62 & 63) thereover, onto a thin metal film (Cf. Fig. 1, element 208), such that the metal layer (Cf. Fig. 1, element 108) over the raised portion of the patterned die (Cf. Fig. 1, element 102) contacts portions of the thin metal film (Cf. Fig. 1, element 208) above said substrate, and applying sufficient pressure such that the metal layer cold-welds (Cf. Fig. 5, Column 1, lines 52 & 53) to the thin metal film.

The '160 teaches a method of etching articles via microcontact printing, including a step of depositing a thin metal film (Cf. Fig. 9a, element 66) over a substrate (Cf. Fig. 9a, element 60) and removing the patterned die (Cf. Fig. 9a, element 20), such that the layer (Cf. Fig. 9a, element

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27) over the raised portion (Cf. Fig. 9a, element 22) of the die adhered to portions of the thin metal film (Cf. Fig. 9a, element 66) with which it has contact, detaches from the die or stamp and remains in contact with the thin metal film (Cf. Fig. 9b, elements 27 & 64) over said substrate in substantially the same pattern as the at least one raised portion of the die, thereby forming a patterned metal layer over said substrate in order to conveniently produce a variety of patterns in the sub-micron domain (Cf. Column 2, lines 32 ff.).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the two teachings by applying the reference of releasing the layer from the die, as taught by the '160, instead of its body structure in order to facilitate the patterns production with micron or sub-micron domain features.

**As applied to claim 9**, the '160 teaches the removing portions of the thin metal film (Cf. Fig. 9c, element 62) that are not covered by patterned metal layer (Cf. Fig. 9c, element 27) formed over the substrate (Cf. Fig. 9c, element 60).

**As applied to claim 10**, the removing of the thin metal film not covered by patterned metal layer by a sputtering process in an old art, also claimed by Applicants (Cf. Applicants' disclosure, page 13, line 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to remove the thin metal film not covered by patterned metal layer by a sputtering process, since it was known in the art that the removal is done by chemical etching (Cf. Fig. 9c, element 62; col. 14, lines 41-46).

**As applied to claim 11**, the '160 teaches the anisotropic etching of the substrate (Cf. Fig. 9d, between element 27; col. 15, line 8) not covered by patterned metal layer.

**As applied to claim 12**, the '160 teaches the removing of the patterned metal layer and the remaining portion of the thin metal layer (Cf. Fig. 9d into 9e, elements 27 & 64; col. 14, lines 53-56).

**As applied to claim 13**, the '398 teaches the deposition of an organic layer (Cf. Fig. 2, element 206) between the thin film metal (Cf. Fig. 2, element 208) and the substrate (Cf. Fig. 2, element 202).

**As applied to claim 14**, the '398 teaches that the organic layer is a single polymer heterostructure LED (Cf. Col. 4, lines 31 ff.).

**As applied to claims 15, 16 and 19-21**, the '398 teaches the deposition of an organic layer (Cf. Fig. 2, element 206) between the substrate (Cf. Fig. 2, element 202) and the thin film metal (Cf. Fig. 2, element 208) which turns into patterned metal layer.

The '160 teaches the anisotropic etching into the substrate (Cf. Fig. 9d, between element 27; col. 15, line 8) not covered by patterned metal layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to remove the portions of the organic layers not covered by the patterned metal layer by ion etching processes with  $\text{CF}_4$ ,  $\text{O}_2$  well known in the art (Cf. Applicants' disclosure, page 13, paragraph 054) to form the patterned substrate, since the exposed organic layers are located above the substrate layer.

**As applied to claim 17**, the '160 teaches the anisotropic etching of the substrate (Cf. Fig. 9d, between element 27; col. 15, line 8) not covered by patterned metal layer.

**As applied to claim 18**, the '160 teaches the chemical etching of the exposed thin film metal (Cf. Fig. 9b & 9c, element 66) and the claimed removing of the thin metal film not covered by patterned metal layer by a sputtering process is an old art, also claimed by Applicants (Cf. Applicants' disclosure, page 13, line 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to remove the thin metal film not covered by patterned metal layer by a sputtering process, since it was known in the art that the removal is done by chemical etching (Cf. Fig. 9c, element 62; col. 14, lines 41-46).

**As applied to claims 24-27**, the '398 teaches that the patterned die if made of silicon, non-reactive material such as glass, non-rigid material such as quartz or hard metals (CF. Col. 2, lines 51 & 52).

**As applied to claims 28-31**, the '398 teaches that the metal layer is of non-reactive material such as silver (Cf. Col. 4, line 56) and the thin metal film is of same material (Cf. Col. 2, lines 62 ff.).

**As applied to claim 32**, the '398 teaches that the metal layer is of chromium (Cr) (Cf. Col. 4, lines 50-53), different from the silver thin metal film (Cf. Col. 4, line 56 and Col. 2, lines 62 ff.).

**As applied to claim 34**, the '160 teaches that the patterns are in the sub-micron or nano resolution (Cf. Col. 2, lines 34 & 35).



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**As applied to claims 35-37**, the '398 teaches that the substrate is made of glass or plastic (Cf. Col. 3, lines 4 & 5).

**As applied to claim 38**, the '398 teaches that the thin film metal layers are electrodes (Cf. Fig. 2, elements 204 & 208; Col.3, lines 17 & 18).

**As applied to claim 39**, the '160 teaches that the patterned metal layer (Cf. Fig. 9d, element 64; col. 14, lines 56-59) is an etching mask for partial substrate removal.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Phan whose telephone number is 703-605-0707. The examiner can normally be reached on M - F, 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1148.

TP

Tim Phan  
Examiner  
Art Unit 3729

Tp  
March 11, 2004

cja  
CARL J. ARBES  
PRIMARY EXAMINER